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Filter sector for use in rotary disc filters for separating pulp suspensions

The present invention relates to a filter sector for use in rotary disc filters for separating pulp suspensions, the filter sector comprising a first filtration wall of a substantially rigid net, and a second filtration wall of a substantially rigid net joined to the first filtration wall to form a filtrate chamber for receiving filtrate that has flowed through the first and second filtration walls, wherein the filtrations walls are profiled to increase the filtration capacity of the filter sector. Filter sectors of this kind are assembled to form circular filter discs for rotary disc filters.

In a known filter sector of this kind, according to Swedish patent application 9901154-6, the filtration walls of net are corrugated to form a plurality of ridges and valleys. As a result, the known filter sector has a greater filtration capacity than that of a traditional filter sector having plane walls of filter cloth.

The object of the present invention is to provide a new filter sector that is devoid of ridges and valleys but still has a greater filtration capacity than that of a traditional filter sector.

This object is obtained by the filter sector described initially characterised in that each wall of net forms a multiplicity of cavities and humps, and that each cavity and hump, respectively, includes a multiplicity of meshes of the net. As a result, the effective filtration area of the filter sector is increased as compared with a filter sector of the same size with plane walls of net, whereby the filtration capacity of the filter sector of the invention is improved.

In a preferred embodiment of the invention, the cavities and humps, respectively, are oriented in rows with the rows of cavities alternating with the rows of humps.

Advantageously, weaving forms the cavities and humps of the net, i.e. a special weaving technique is employed while weaving the net, which makes the new filter sector inexpensive to manufacture. Alternatively, pressing may form the cavities and humps of the net.

Each cavity and hump, respectively, may be defined by four straight sides, wherein each straight side of a cavity is common to one of the four straight sides of an adjacent hump.

The first and second walls of the net may take the shape of a bag.

The present invention is described in more detail in the following with reference to the accompanying drawings, in which Figure 1 is a front view of an embodiment of the filter sector according to the present invention,

Figure 2 is a detail of the filtration wall of the filter sector shown in Figure 1,

Figure 3 is a sectional view of the filter sector of Figure 1, Figure 4 is a filter unit forming part of the embodiment shown in Figure 3, and

Figure 5 is a sector frame forming part of the embodiment shown in Figure 3.

Figure 1 shows a filter sector 1 according to an embodiment of the present invention comprising two opposite filtration walls 2 and 3 of a substantially rigid metal net joined to each other and defining a filtrate chamber 4 for receiving filtrate that

has flowed through the filtration walls 2,3. Each filtrate net wall 2 and 3, respectively, forms a multiplicity of four-sided cavities 5 and humps 6 (Fig. 2), each of which includes a multiplicity of meshes of the net, in this embodiment in the order of about 50 meshes. A filtrate outlet 7 for filtrate that has flowed through the filtrate walls 2,3 to the filtrate chamber 4 is provided at the radial inner end of the filter sector 1. A plurality of such filter sectors 1 are intended to be assembled to form a circular filter disc that is used in a rotary disc filter for separating pulp suspensions.

With reference to Figures 3-5, the filtrate walls 2 and 3 are joined to two support walls 8 and 9, respectively, made of a plane metal net that is courser than the net of the filtrate walls 2,3. The support walls 8,9 are joined to each other, at the radial sides of the filter sector 1, whereby the filtrate walls 2,3 and support walls 8,9 form a bag-shaped unit 10. (As an alternative, however, the support walls 8,9 may not be joined together, so that the filtrate wall 2 and support wall 8 form a first single unit and the filtrate wall 3 and support wall form a second single unit.) The bag-shaped unit 10 fits on a sector-shaped rigid grid frame 11 that forms a central filtrate channel 12. The assemblage of the bag-shaped unit 10 and the grid frame 11 (illustrated in Figure 3) is releasably secured to a frame 13 of the filter sector 1.

In case the specific use of the filter sector 1 permits a design of the filtration walls 2,3 in which the metal net can be made stiff enough, the support walls 8,9 of courser net may be omitted. In such a case the filtration walls 2,3 may either be separate from each other or be joined to to form a bag-shaped unit.

In operation, a pressure difference is created across the filtrate walls 2,3 while they are immersed in a suspension to be separated, so that a filtrate of the suspension is pressed through the filtrate walls 2,3 into the filtrate chamber 4. The filtrate flows further through the support walls 8,9 of courser metal net into the filtrate channel 12. In the filtrate channel 12 the filtrate changes flow direction from a substantially axial direction to a substantially radially inward direction towards the filtrate outlet 7.



Claims

1. A filter sector (1) for use in rotary disc filters for separating pulp suspensions, the filter sector comprising a first filtration wall (2) of a substantially rigid net, and a second filtration wall (3) of a substantially rigid net joined to the first filtration wall to form a filtrate chamber (4) for receiving filtrate that has flowed through the first and second filtration walls, wherein the filtrations walls are profiled to increase the filtration capacity of the filter sector, **characterised** in that each filtration wall (2,3) is profiled to form a multiplicity of cavities (5) and humps (6), and that each cavity and hump, respectively, includes a multiplicity of meshes of the net.
2. A filter sector according to claim 1, wherein the cavities (5) and humps (6), respectively, are oriented in rows with the rows of cavities alternating with the rows of humps.
3. A filter sector according to claim 1 or 2, wherein the cavities (5) and humps (6) are formed by weaving the net.
4. A filter sector according to claim 1 or 2, wherein the cavities (5) and humps (6) are formed by pressing.
5. A filter sector according to any of claims 1 - 4, wherein four straight sides, respectively, define each cavity (5) and hump (6).
6. A filter sector according to claim 5, wherein each straight side of a cavity (5) is common to one of the four straight sides of an adjacent hump (6).

7. A filter sector according to any of claims 1-6, wherein the first and second filtration walls (2,3) of the net take the shape of a bag.
8. A filter sector according to any of claims 1-7, wherein the net comprises a metal net.

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ABSTRACT

A filter sector (1) for use in rotary disc filters for separating pulp suspensions comprises filtration walls (2) of a substantially rigid net joined to each other to form a filtrate chamber (4) for receiving filtrate that has flowed through the filtration walls. Each filtration wall is profiled to form a multiplicity of cavities (5) and humps (6), and each cavity and hump, respectively, includes a multiplicity of meshes of the net. The provision of cavities and humps increases the filtration capacity of the filter sector.

Figures 1 and 2

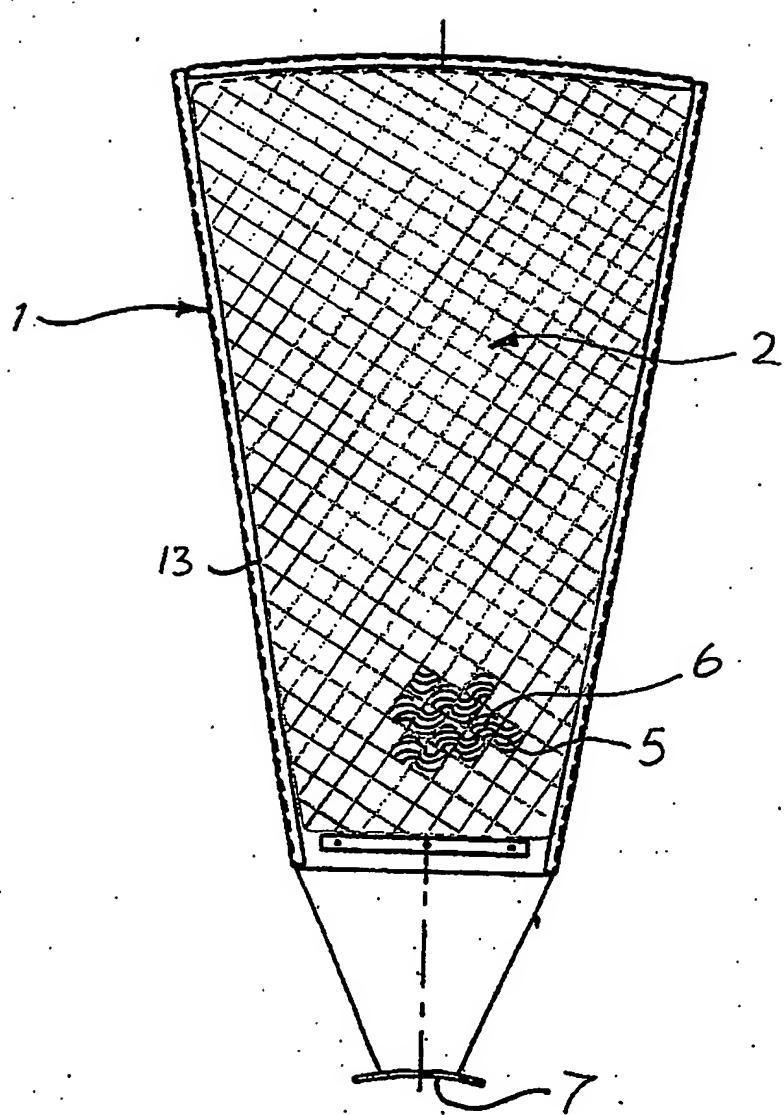


Fig. 1

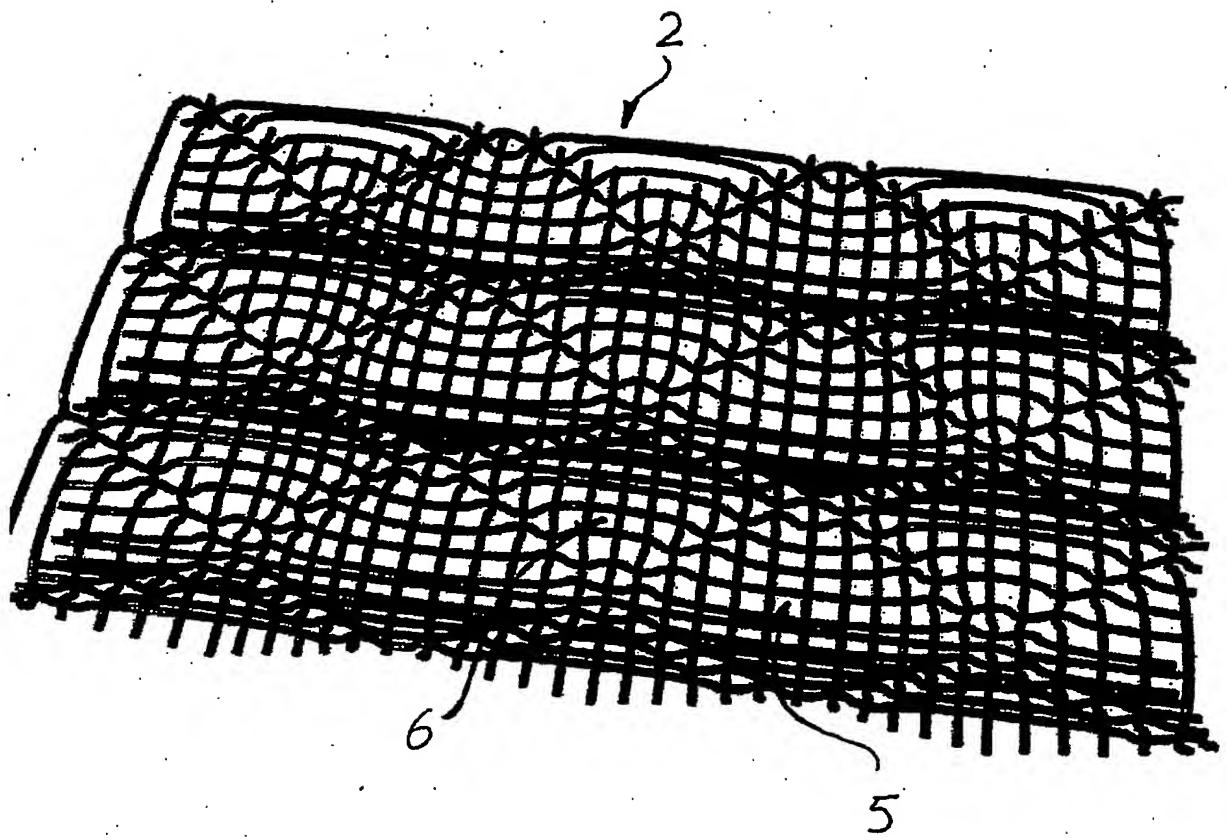


Fig. 2

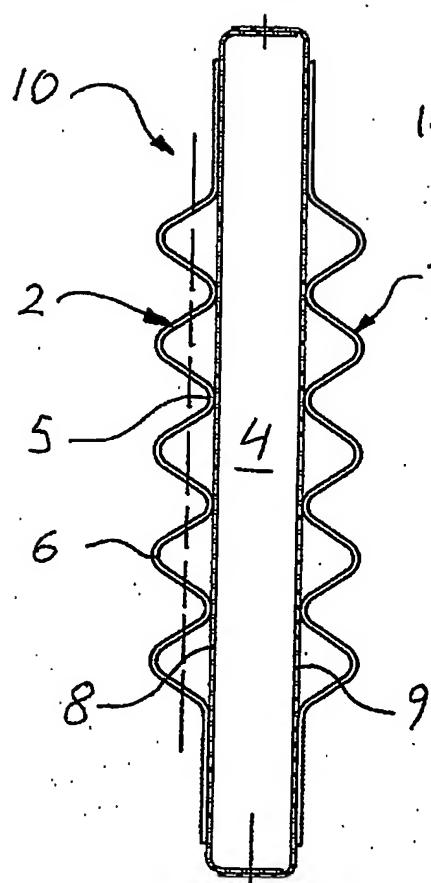


Fig. 4

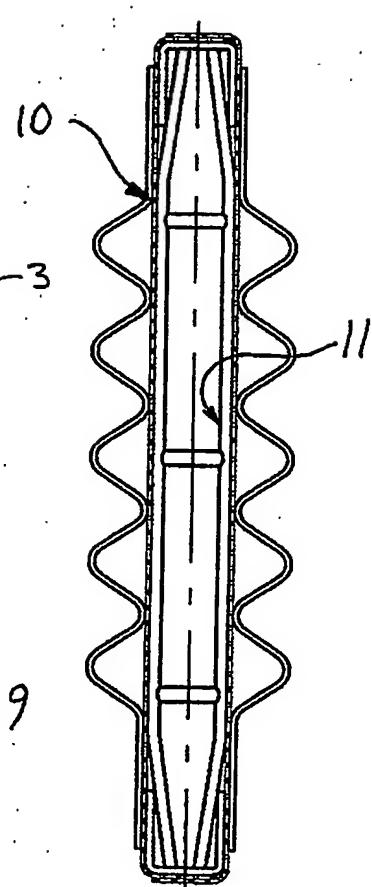


Fig. 3

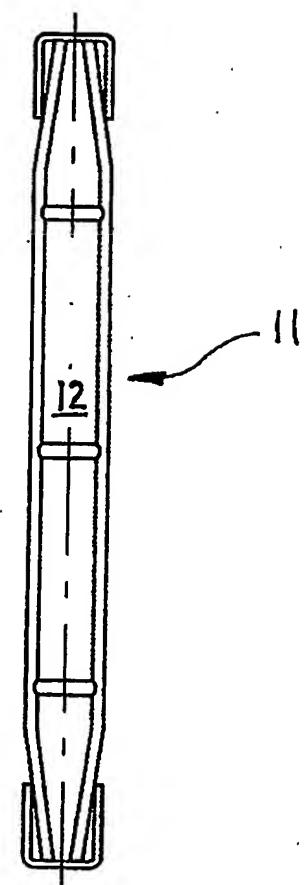


Fig. 5